

TRANSACTIONS

OF THE

PHILADELPHIA ACADEMY OF SURGERY.

Stated Meeting, January 4, 1909.

The President, DR. WILLIAM J. TAYLOR, in the Chair.

CONGENITAL UMBILICAL HERNIA.

DR. FRANCIS T. STEWART reported the history of a male infant, born at 7½ months of gestation. The umbilical ring was about 2 inches in diameter, and the cord maintained this calibre for a distance of about 4 inches, when it began to taper to the point where it had been ligated. The cord was filled with a thick, glistening, gelatinous fluid, except at its base, where a sac, continuous with the peritoneum and about 2 inches long, was found separating the vessels of the cord, the arteries lying below and the vein above. A collar of abdominal skin extended up on the cord for perhaps one-fourth inch. Several coils of small intestine could be seen distending the sac through the transparent tissues of the cord, which were as thin as paper. There were no other abnormalities except a small postanal dimple. Several hours after birth the child ceased breathing, became cyanotic, and was restored only after the administration of oxygen and artificial respiration. Operation was undertaken nine hours after birth, without an anæsthetic. The sac was resected, the recti muscles approximated with catgut, and the skin sutured with silk-worm gut. The umbilical arteries felt as firm as the vas deferens and did not bleed when severed, although they could be felt pulsating within the abdomen a short distance below the umbilicus. The skin about the umbilicus was bloodless and resembled white leather. The child was in good condition at the end of the operation but about three hours later developed another attack of apnoea which proved fatal.

Dr. Stewart remarked that congenital umbilical hernia was rare. Adler found one in 5887 new-born infants, and Lindfors one in 5184. Coley says 4 cases were seen among the 75,000 cases of hernia treated at the Hospital for Ruptured and Crippled in New York. Of 37 cases assembled by Lindfors 22 were boys and 15 girls, of the 69 in Buschan's collection 43 were boys and 26 girls.

These herniæ are divided into the embryonic and the fetal, the former developing as the result of arrested development of the abdominal wall, the latter after the umbilicus is closed and lined with peritoneum.

The *embryonic variety*, strictly speaking, is a congenital malformation and not a hernia, because, since its contents have never resided within the abdomen, they cannot have herniated. The blastodermic layers of the embryo arrange themselves in two layers, the somatopleure (ectoderm fused with the external lamella of the mesoderm) and the splanchnopleure (endoderm fused with internal lamella of the mesoderm). These layers curl in from the side so as to form two closed tubes, one within the other, the outer or somatopleure becoming the thoracic and abdominal walls, and the inner or splanchnopleure the primitive digestive tube. The vitelline sac, which is continuous with the primitive intestine, thus becomes constricted at its embryonic attachment, forming the vitelline or omphalomesenteric duct, the intestinal opening of which has been called the intestinal umbilicus. Occasionally this duct persists in after life and is then called Meckel's diverticulum. Between the periphery of the intestinal umbilicus and that of the cutaneous umbilicus is an annular space, large above where it corresponds to the cardiac fossa, and smaller below where it gives passage to the allantois. The primitive abdominal wall (*membrana reuniens inferior* of Rathke) is an exceedingly thin membrane, which progressively advances over the viscera until, at the beginning of fetal life (end of third month), the cutaneous umbilicus is represented by a small circular space through which passed the umbilical vessels, the allantoic and the vitelline pedicles having vanished. When this process is arrested before its completion an embryonic hernia exists.

The coverings of this hernia consist of two avascular layers separated by a greater or lesser quantity of Wharton's jelly. The external layer, corresponding to the amnion, merges with the

collar of skin at the base of the tumor; the internal is continuous with the peritoneum, some believing it to be peritoneum, and others, because of its avascularity, a vestige of the *membrana reuniens inferior*.

The size of the defect varies greatly. An early arrest of development may leave a gap extending from the manubrium to the symphysis pubis. In these cases the heart may be found outside the thorax, but the lungs are retained in position by their pedicles. The pancreas is the only abdominal organ which has not been found in the hernial sac. Such extensive defects are rare, but not infrequently the opening extends from the umbilicus to a point somewhat above the middle of the upper half of the *linea alba*, giving passage to the liver, with or without a portion of the intestine, the umbilical cord lying below, either in the middle line or more often to the left. In living infants the tumor is generally much smaller, seldom exceeding a mandarin orange in size, and either separating the vessels of the cord or pushing them to the left. Ordinarily one or two coils of small intestine are in the sac and occasionally a portion of the liver or the *cæcum*. The presence of the last-mentioned structure is explained by its contracting adhesions with the hernial envelopes before it descends to its final position, or by persistence of the *omphalomesenteric duct*, which arises from the ileum near the *cæcum*. The *omphalomesenteric duct* itself may therefore be found in the hernia, either as a blind pouch springing from the ileum, or as a canal which opens externally at the summit of the tumor, thus forming an abnormal anus. In the latter instance the normal anus may be absent and the large intestine undeveloped. Usually, however, the presence of an *omphalomesenteric duct* reveals itself by a minute fistula, arising spontaneously or as the result of ligation of the cord. If the intestinal end closes there is an umbilical fistula or, consequent upon hypertrophy of the everted mucous membrane, an *umbilicus polypus* or adenoma. If both ends close the tube may distend with mucus and form an umbilical or vitelline cyst. When the *allantoic duct* persists it may appear on the surface of the hernial sac, after ligation of the cord, as a *pseudopenis* discharging urine. Like the vitelline duct it may close at one or both ends and give rise to similar fistulae, polyps, and cysts. The persistence of these vestiges in the cord have led some to think that they cause the hernia by preventing closure of

the umbilicus. Among other deformities which may be present are epispadias, exstrophy of the bladder, imperforate urethra, imperforate anus, atresia of the large intestine, spina bifida, sacrococcygeal tumor, branchial cyst, etc.

The *fetal variety* of congenital umbilical hernia develops after the third month of intra-uterine existence when the umbilicus is lined with peritoneum. It is therefore covered with peritoneum and is a true hernia. When developing in the early part of fetal life it occupies the centre of the cord and separates the vessels. At a later period the vessels are fixed at the inferior segment of the umbilical ring and are pushed below and to the left by the hernia, which thus corresponds to the usual situation of umbilical protrusions in infants and adults. These herniæ are rarely of large size and usually contain nothing but small intestine. Of the numerous theories given for their origin none is satisfactory; those who are interested in this portion of the subject will find the matter fully discussed by Cumston (*Med. Rec.*, Sept. 3, 1905).

Symptoms.—Children with enormous abdominal fissures are usually born dead before term, the hernial coverings frequently tearing during labor, or yielding even before this time so that the viscera float free in the amniotic fluid. Large herniæ are frequently irreducible, owing to adhesions between the viscera and the sac or to lack of room within the abdominal cavity.

The smaller herniæ are more common and are as a rule easily recognized. The coverings of the tumor are ordinarily so thin and transparent that the viscera can be seen, and the usual features of a hernia are present. When the protrusion is very small, however, it may be overlooked by the obstetrician and be ligated with the cord, particularly if there are adhesions detaining the contents within the sac. A urinary omphalocele is fluctuating, transparent, dull on percussion, and often associated with imperforate urethra.

The *prognosis*, aside from the complications mentioned above, depends largely upon the size of the hernia and the duration of gestation. In infants who survive birth large herniæ usually rupture within the first few days, as the result of ulceration or sloughing of the sac, which has been deprived of its means of nutrition, peritonitis and death following. Spontaneous recovery, however, is possible, the sac becoming covered with granulations and these with epidermis, the abdominal muscles gradually closing in at a later period.

The treatment is operation, as early as possible, in all cases excepting the enormous defects incompatible with existence, and the very small reducible herniæ in which a firm, vascular peritoneal sac is present. The latter should be protected from injury and infection, and reduction maintained with a suitable bandage.

Anæsthesia is not necessary and perhaps is better omitted. The best operation is excision of the sac with the collar of skin at its base and closure of the defect with through-and-through silk-worm gut sutures, through-and-through sutures to save time, silk-worm gut to resist the sudden and frequent augmentations in the intra-abdominal pressure as the result of crying. The subcutaneous ligature is blind and dangerous. The extraperitoneal method of Olsbausen, in which the sac is reduced without being opened, may be followed by gangrene of this structure. In any method in which the sac is not opened one may fail to discover complications, *e.g.*, a persistent omphalomesenteric duct.

The recent statistics of Ritterhaus (*Deutsche Zeit. für Chir.*, 1907, Bd. 89, p. 257), comprising 94 laparotomies up to 1907, show 65 recoveries and 29 deaths, a mortality of 31 per cent. According to Adler laparotomy within the first 24 hours gives a recovery rate of 88 per cent., after 48 hours, 33 per cent.; of the 72 cases which he collects 27 per cent. died. Jaboulay and Patel (*Nouveau Traité de Chir.*, 1908, T. 25), to whom we are indebted for many of the facts cited above, state, after Aribat, that the mortality of expectant treatment is 50 per cent.

PROPERITONEAL HERNIA.

DR. STEWART reported the history of a man, aged 46 years, who was admitted to the Pennsylvania Hospital, November 28, 1908, in the service of Dr. Gibbon. The patient had been suffering with acute intestinal obstruction for three days. He had been wearing a truss for a left-sided inguinal hernia since childhood, but the hernia had not been down for many years. He had never noticed a hernia on the right side. Both inguinal canals were empty, although on coughing an impulse could be obtained in each. The testicles were normal in form and position. The abdomen was not rigid and only slightly distended, but no tumor could be felt externally or by rectal examination. Peristalsis was active but unproductive, the vomitus black but not fecal in odor. The pain and tenderness were generalized and perhaps

most marked in the left iliac fossa. The condition was thought to be a volvulus or a strangulated internal hernia. After making a median abdominal incision below the umbilicus it was discovered that a loop of ileum had entered a sac of peritoneum lying immediately behind the internal inguinal ring of the right side. The neck of the sac, which was dense and resistant, was nicked with scissors and the bowel extracted. The furrow of constriction had passed exactly across the mesenteric border of the affected loop, hence almost determining a Richter's hernia. The bowel was not gangrenous. The sac was about two inches in diameter and passed neither outwards nor inwards. No communication with the scrotal sac could be found. A similar sac, empty however, was discovered behind the left internal ring. After suturing the orifice with catgut the abdomen was closed, the patient making a smooth recovery.

The rarity of properitoneal hernia is shown by the statistics of Breiter (*Beiträge zur klin. Chir.*, Bd. 13, 1895), who has been able to add only 45 cases to the 24 collected by Krönlein in 1880; about a dozen additional cases might be added to this list. Of these 69 cases 59 were inguinal and 10 femoral.

Of the *inguinal variety* 33 were right-sided, 20 left-sided, and 6 undetermined. Fifty-eight occurred in males, and 23 of these had maldescended testicles. The youngest patient was 18, the oldest 74, and the majority were between the twentieth and fortieth year. An external hernia was present in all but two cases; in one of these the tip of the little finger just entered the internal ring, from within outwards, and in the second there was a small hydrocele. In his own case an external sac could not be found on either side, although one had surely existed on the left side. The average duration of the external hernia was 19 years. Of the 58 males the hernia was congenital in 36, acquired in 10, and undetermined in 12. With a single exception all were incarcerated, and in only two of these was the hernia reduced before operation. In 22 of the 36 inguinal cases collected by Breiter a sausage-shaped tumor could be felt above Poupart's ligament, running outwards towards the anterior superior spine of the ilium (*intra-iliac variety*). If the sac passes into the small pelvis (*obturator variety*) it might be felt by rectum; an antevsical sac could possibly be palpated through the abdominal wall. In three instances the hernia was partial (Richter's hernia).

With a bilocular hernia strangulation may occur at the common opening of the two sacs into the abdominal cavity or at the orifice of either sac. The first of these is the more frequent, thus explaining the large number of deaths even after herniotomy, the operator often failing to discover the inner constriction and simply reducing the contents of the outer into the inner sac. This phenomenon may be determined by observing an increase in the size of the iliac tumor, if present, when the outer sac is emptied, and by passing the finger into the abdominal cavity to investigate the parts in the vicinity of the internal ring, a measure which should be insisted upon in all operations for strangulated hernia. The symptoms of obstruction are said to be often insidious in development and less severe than in an ordinary strangulated hernia. Sometimes the patient states that there is a feeling of incomplete reduction even after the outer hernia has been replaced, in other cases severe pain follows, particularly if the testis is in the inguinal canal.

Of the *femoral variety* only 10 cases are recorded, all in women. In but two of these was the inner sac discovered as a tumor before operation. Seven were strangulated.

The *diagnosis* of properitoneal hernia is seldom made before operation, and sometimes not even at operation. The following features should lead one to suspect this condition: An irreducible external hernia in an adult, with a tympanitic tumor above Poupart's ligament which increases in size when pressure is made on the outer sac, and *vice versa*; maldescent or late descent of the testes, particularly the right; long duration of the hernia; the feeling of incomplete reduction which the patient may have previously experienced, hence failure of truss treatment; and the mild character of the obstructive symptoms.

While before 1880 all cases ended fatally the mortality at the present time is in the neighborhood of 34 per cent.

Several theories have been advanced to explain the formation of a properitoneal hernia. (1) The neck of an external hernia is displaced upwards and forms a diverticulum, as the result of narrowing of the mouth of the sac, which hinders reduction of the contents. The same result follows conditions which, while narrowing or closing the external ring, do not prevent the entrance of the hernia into the canal, *e.g.*, badly fitting truss, maldescended testicle, etc., and traction on the neck of the sac by adherent

omentum or bowel. (2) Reduction in mass. (3) A congenital deformity of the vaginal process. (4) A properitoneal sac is formed first, perhaps by traction of a mass of fat or accentuation of a peritoneal fossa, the external hernia developing secondarily.

HERNIA INTO THE RETROCOLIC FOSSA.

DR. STEWART reported the history of a man, aged 86 years, who was subjected to a suprapubic prostatectomy in April, 1896. Three days later he complained of abdominal cramps after the administration of calomel. After a copious bowel movement the pain became steady and localized itself in the right iliac fossa, in which region palpation disclosed tenderness and slight muscular rigidity. The following day the bowels moved again and the pain had disappeared, although there was hiccoughing and slight distention, both of which increased during the next 24 hours, during which time another bowel movement was reported. The pulse, temperature, and respirations were normal and there was no vomiting. On the fourth day from the onset of pain the patient suddenly vomited a large quantity of dark, foul-smelling fluid and died quickly thereafter.

A limited and hurried autopsy showed that a loop of the lower ileum had passed up behind the cæcum into a cavity about 4 inches in diameter. The anterior wall of this cavity was formed by the cæcum, the posterior by parietal peritoneum, the outer or right by a fold of peritoneum passing from the cæcum to the posterior abdominal wall, and the inner or left by a similar fold of peritoneum. The mouth easily admitted two fingers. The appendix with its mesentery was situated to the front and left, stretched over the neck of the sac. The bowel was not gangrenous, but a well-marked furrow could be seen at the point of constriction.

The retrocolic or retrocæcal fossa, according to Moynihan ("Retroperitoneal Hernia," London, 1899), is determined by two peritoneal folds, an outer and upper, and a lower and inner. The former, or parietocolic fold, called also right or superior ligament of the cæcum, is triangular in shape, the posterior border being attached to the abdominal wall from the lower pole of the kidney or higher to the iliac fossa, the anterior or internal to the postero-external aspect of the colon and sometimes the cæcum, and the lower or free border extending from the intestine to the iliac fossa. The lower and inner, or mesentericoparietal fold,

called also inferior ligament of the cæcum, is in reality the insertion of the enteric mesentery into the iliac fossa. It too is triangular in form, the base being inserted into the iliac fossa at about the point where the spermatic vessels cross the external iliac arteries; the intestinal border, into the small intestine and postero-internal aspect of the cæcum and ascending colon; and its free edge, concave, looking downwards and to the right. The fossa is bounded in front by the posterior surface of the ascending colon and sometimes by that of the cæcum, and behind by the parietal peritoneum. Its orifice looks downwards, and will not infrequently admit the index finger.

Moynihan mentions 11 cases which have been looked upon as hernia into the retrocolic fossa and rejects all but two. This form of hernia is so rare, according Treitz, because its orifice looks downwards, and therefore the intrusion of the gut is to some extent prohibited by gravity, and because the orifice of the sac is not resistant, and does not contain any vessel. These remarks do not apply to the vermiform appendix, which is not infrequently found in the retrocolic fossa. In some of these cases the appendix is described as lying between the layers of the mesocolon or behind the peritoneum, and it is in such cases that an inexperienced operator may fail to find the organ.

FRACTURES OF THE PELVIS.

DR. HENRY R. WHARTON reported three cases of fracture of the pelvis, as follows:

CASE I.—Man, aged 34 years, a locomotive fireman, was admitted to the Presbyterian Hospital May 5, 1908, having been caught between the tender of a locomotive and a water tank. On admission he was suffering from shock, contusion of the back, and tenderness over the lower portion of the abdomen. There was some bleeding from the urethra. A rubber catheter introduced into the urethra withdrew several drachms of blood, and the catheter could not be introduced into the bladder. A metal catheter was then passed and drew clear urine. The following day the patient complained of pain over the lower portion of the abdomen, and there was some discoloration of the skin over the perineum and posterior portion of the scrotum; the patient was able to pass his urine, which was slightly tinged with blood.

There was some rigidity over the lower portion of the abdomen. The patient's condition remained the same for some days, and repeated examinations failed to elicit any symptoms of fracture of the pelvis. An X-ray examination was made with a negative result.

The patient, ten days after admission, still complained of tenderness on pressure over the pubis, and a mass three inches in diameter could be demonstrated in this region. About this time there was a moderate elevation in his temperature, and there was a decided leucocytosis.

On June 2 a small abscess developed upon the upper left side of the perineum, which was incised. As the patient's condition was not improving, and the mass over the pubes was still tender upon pressure, it was decided that this should be incised. An incision in the median line, two inches in length, one and a half inches above the pubis, opened an abscess which contained several ounces of broken-down blood-clot and offensive pus. Exploration of this cavity with the finger revealed a fracture of the horizontal ramus of the pubes, with the fragments in good position, and the sinus resulting from the abscess previously opened was found to communicate with the abscess cavity. A week after the suprapubic opening had been made urine began to escape from this opening. An X-ray examination made at this time showed a fracture of the pubic bone on the left side. The patient did not improve in spite of the free drainage, the temperature became more elevated, and he developed marked septic symptoms; and he died on July 22.

In this case injury of the bony pelvis was not suspected, as the symptoms pointed to a contusion of the lower abdomen, with the formation of a blood-clot above the pubes, and it was only when this had become infected, and abscess had formed, that the true nature of the injury was disclosed. It is possible in this case that earlier operative interference might have averted the fatal issue.

CASE II.—Man, aged 25 years, a moulder employed in a steel mill, was struck upon the pelvis by a flask weighing about 1000 pounds, which produced a fracture of the pubes and a lacerated wound of the perineum, from which there was free bleeding. He was brought to the Presbyterian Hospital May 26, 1906, ten hours

after the accident, when examination showed that there was a fracture of the pubis involving the left side, a lacerated wound of the perineum which exposed the anterior wall of the rectum for a considerable distance; the abdomen was moderately distended, and the bladder was also markedly distended; a small amount of blood-stained urine escaped from the perineal wound.

The patient was etherized, and exploration of the perineal wound with the finger showed that it extended to the base of the bladder; a fracture of the pubes, with some displacement of the fragments, could also be demonstrated. It was found impossible to pass a catheter into the bladder through the penis or through the perineal wound. It was then decided to open the bladder above the pubis and attempt a retrograde catheterization. This was done, a catheter was passed through the bladder into the urethra and secured in this position, and the suprapubic wound was closed. Drainage was also introduced into the perineal wound. The suprapubic wound opened and discharged urine in a few days, and free purulent discharge occurred from the perineal wound for several weeks, which was accompanied by marked febrile disturbance, but at the end of three weeks the bladder drainage was removed, and at this time he voided urine partly through the urethra, the suprapubic opening, and the perineal wound. A sound was passed each day through the urethra into the bladder, and the leakage of urine from the perineum gradually ceased. The suprapubic and perineal wounds gradually healed, and he was able to pass the urine freely by the urethra, and was discharged from the hospital on August 25, 1906, in good condition.

He was advised to continue the passage of the sound at intervals, and when last seen, a year after the accident, he was in good health, and had no difficulty in passing urine, but was still passing the sound at intervals.

CASE III.—Boy, aged 12 years, was run over by an ice wagon loaded with 1800 pounds of ice, the wheels passing obliquely over the pelvis from left to right. He was admitted to the Presbyterian Hospital July 14, 1908, a few minutes after the accident, and exhibited the symptoms of shock in a most marked degree. Examination revealed a lacerated wound, exposing the abdominal muscles three inches to the right of the umbilicus; also an abrasion

of the upper part of the left thigh, 4 inches by 6 inches, with several other less serious abrasions. Examination also revealed separation of the left sacro-iliac joint, and a marked separation of the pubic bones at the symphysis; the right leg was abducted and showed apparent lengthening. A catheter passed into the bladder drew clear urine. Examination of the rectum showed no blood, so that it was concluded that these viscera had escaped injury. X-ray examination showed that the injury to the pelvic bones was very extensive, consisting of the marked separation of the left sacro-iliac joint, complete separation of the pubic bones with downward displacement, and a fracture through the right iliac bones just above the acetabulum.

The patient was actively treated for the condition of shock, the wounds and abrasions were dressed, and a firm muslin binder was applied around the pelvis and was reinforced by broad straps of adhesive plaster.

The patient gradually reacted from the condition of shock, and as soon as the condition of the wounds would permit, a plaster-of-Paris bandage, including the pelvis and upper portion of each thigh, was applied.

The patient made an uninterrupted recovery and was discharged from the hospital August 18, 1908, but was kept in his bed at home, with the plaster-of-Paris bandage in position, for a month subsequently. The reporter has been informed that the boy is now able to walk without difficulty and is in good condition. The remarkable feature in this case was the extensive damage to the pelvic bones without damage to the pelvic viscera.

LARGE GALL-STONE REMOVED FROM THE COMMON DUCT.

DR. WHARTON reported the history of a man, aged 56 years, who was admitted to the Presbyterian Hospital with the history that he had suffered for the last few years with recurrent attacks of pain in the epigastrium, and jaundice. At the time of his admission he was very markedly jaundiced, and complained of pain on pressure over the gall-bladder. His temperature was elevated and there was tenderness on pressure over the gall-bladder.

The gall-bladder was exposed and opened, and contained several ounces of pus and two gall-stones. The region of the common duct was explored, but no stone could be felt. The gall-

bladder was drained, and the patient's general condition improved, and the jaundice disappeared. The sinus leading to the gall-bladder still continued to discharge a large quantity of bile. He left the hospital some weeks after the operation with the sinus still discharging a large quantity of bile.

He returned a short time ago, stating that the bile still continued to escape freely from the sinus. His general health at this time was good. Upon opening the abdomen the common duct was found to be obstructed by a large stone, which was removed and the duct drained. The common duct in this case seemed to occupy a much lower position in the abdomen than is usual, possibly being dragged downward by the weight of the contained stone, which may account for the fact that it was not discerned at the first operation. The patient made a rapid recovery, the wound being entirely healed in three weeks.

DR. JOHN B. DEEVER said that this stone presented by Dr. Wharton was a particularly large one. He had extracted as large stones, and in a few instances larger ones, but they are very unusual. That very day he had operated on a physician, 77 years of age, whom he had had under his care before. He was first operated upon some six years ago, when he had a larger stone in the common duct than the one shown by Dr. Wharton. He had a choleduodenostomy formed by nature which explained the absence of jaundice. There was no difficulty in removing the stone, but a good deal in dealing with the gall-bladder. He made an uneventful recovery. A year later he came back with a forming abscess in the region of the field of operation, which was opened and drained and he went home well. Later he reported that he had slight jaundice with renewed symptoms of stone in the common duct. At the operation that day he was found to have three stones in his common duct and two stones in the right hepatic duct; one of the stones in the hepatic duct was removed without difficulty; the second, as it could be felt with the finger but could not be delivered, was broken up until the gall-stone scoop could be passed well into the hepatic duct, which so far as could be seen was clear. The stones in the common duct were not as large as this of Dr. Wharton's, but were of good size. Those in the right hepatic duct were smaller.

Now the lesson he had learned from this, as well as from other cases of this kind, is, never to do a cholecystectomy when a

cholecystostomy will suffice. One of the reasons why the gall-bladder should not be removed, from a physiological standpoint, is that if the patient is the subject of subsequent stone formation, the stones will form in the common or hepatic ducts, while if the gall-bladder had been left they would more than likely have formed in it. The hepatic duct stones in the case now reported formed because the common duct was practically filled by the three large stones. He was pretty sure that he did not miss these stones in his first operation, because he had the common duct wide open; therefore he believed these stones to be a subsequent formation. However he had had the same experience as Dr. Wharton, that of opening the gall-bladder and failing to find the stone, and then finding it subsequently.

GOITRE AS AFFECTED BY THE X-RAY.

Dr. WILLIAM J. TAYLOR reported the history of a young girl, aged 15 years, who had a goitre involving both lobes of the thyroid, which was not large, but was distinct and at times interfered somewhat with her breathing. In view of her age and the small size of the growth, and because her mother was much opposed to any operation, the use of the X-ray was advised.

She therefore went to Dr. S. Mason McCollin quite frequently from the middle of January, 1905, to June of that same year, for treatment by the X-ray. Under its influence the circumference of the neck diminished one and one-half inches, that is from thirteen and one-half to twelve inches. An extraordinary chain of symptoms, however, developed. After the exposures had been continued for this length of time, and coincident with the diminution in the size of the goitre, she became very nervous, her eyes prominent, her heart action very rapid, and she presented all of the symptoms of exophthalmic goitre. As soon as the exposures to the X-ray were stopped all these symptoms subsided, and while there was no increase in the growth of the thyroid, her general condition was very much improved.

That the X-ray is powerful in its action is undoubted; and the peculiar behavior of this growth, simulating so closely the symptoms of an overdose of thyroid secretion, would tend very much toward confirming the theory that exophthalmic goitre is due to an excess or systemic poisoning by this secretion. It is known that the X-ray produces an overgrowth of fibrous tis-

sue and a gradual contraction of all glandular tissue. Is it not possible that the long continued use of the X-ray squeezed the thyroid and thus produced systemic poisoning from the secretion?

DR. C. L. LEONARD (by invitation) remarked that he had had under treatment cases which exhibited not so marked symptoms of Graves's disease, since they resulted from overdosage and carrying the treatment too far. In his first case, the goitre disappeared, but the treatment was carried too far and the patient had temporary disturbance in the gait and unsteadiness, which has now been entirely recovered from. That was over four years ago, and the patient is now in perfect health. In the second case treated four years ago, in a young girl of 18, the treatment was suspended before the goitre disappeared completely in order not to carry it too far. Six months later the continued effect of the treatment was shown in the complete reduction of the growth. He had had another case of simple goitre in which treatment was stopped about six months since. The patient is now perfectly free from any symptoms or signs of goitre. But the most remarkable effects he had seen had been in the forms of exophthalmic goitre. One patient had all the symptoms of exophthalmic goitre, with the exception of exophthalmos. She recovered completely from all the symptoms of Graves's disease. When asked if she had any more trouble with her heart, she said, only when she ran for trolley cars! Dr. Leonard had seen in the Liverpool Hospital cases of exophthalmic goitre which were most remarkable, the patients having been referred for treatment in the last stages of the disease, when they were completely bedridden. They recovered to such a degree that they were about the wards but were not fully recovered at the time he saw them, although markedly improved, their charts showing a rapid decrease in the symptoms and pulse rate. The remarkable results achieved by Röntgen treatment are the more remarkable since these patients are only referred for treatment when the disease is far advanced. The case reported is only an evidence of the efficiency of this treatment and a warning that the treatment must not be carried too far or, as in the older complete operations, the total removal or destruction of the gland will produce grave symptoms.

DR. JOHN B. DEEVER said that he could not see the philosophy of treating simple goitre with the X-ray, because the surgical treatment is so brilliant and satisfactory. Dr. Taylor's patient

objected to operation. In the case of exophthalmic goitre it may have a field. His recent experience, since he had given up the removal of the cervical ganglia of the sympathetic nerve, had been satisfactory. He now confined the patient to bed for several days before operation, gave Beebe serum, ligated one or more of the thyroid arteries, and later removed half of the gland. His results are now so good that he would hesitate about advising X-ray treatment until it was demonstrated to be more beneficial. Where the X-ray has been applied for any length of time it makes the dissection more difficult, another thing which would make him hesitate to use it. He had used the X-ray for the purpose of thickening the capsule but latterly had given this up.

DR. WILLIAM J. TAYLOR said that he had purposely said nothing about exophthalmic goitre in his report, as this case was one of true goitre, and not Graves's disease. The patient was a healthy, bright, strong, lusty girl of 15. She had no tachycardia, no symptoms whatever except that the goitre produced a little pressure on her trachea and gave her some dyspnoea on exertion. The question of treatment of exophthalmic goitre by the X-ray of course is a very different subject, and one to be gone into with a great deal of elaboration. The results of any form of treatment of exophthalmic goitre are to his mind somewhat doubtful, as he had seen a number get well if kept in bed. Many cases come to the Orthopædic Hospital and Infirmary for Nervous Diseases, are put to bed on a rest treatment, are built up, and get entirely well in a short time. If the X-ray was used they would say the X-ray had produced that result. He would not say that the X-ray will not produce good results, as he had not had any experience with them. Personally, he should feel very anxious about the use of the X-ray in an exophthalmic goitre case, because if one squeezes still more of the secretions into the individual a more profound intoxication is produced. The operative results in the very persistent exophthalmic cases are so very good that personally he was inclined toward the operative treatment rather than the X-ray. He agreed with Dr. Deaver in the statement that the X-ray produces a change in the tissues and makes dissection much more difficult. This is demonstrated very effectually in cases of glandular disease of the neck. Several times he has been unfortunate enough to be compelled to operate after X-rays had been used, and at times it was almost impossible to tell one tissue from

another, and where one could ordinarily use a blunt dissector a knife or scissors is required.

Some of these patients at the Orthopædic Hospital have remained well, and personally he would not consent to operate on cases of exophthalmic goitre without a preliminary trial of the rest treatment. Some, of course, will get progressively worse in bed. One of the cases upon which he operated for Dr. Mitchell, some four or five years ago, was in bed for months; every possible means was tried to help him, and standing by this man's bed you could see the mattress shake. He removed his thyroid, first attempting it without an anæsthetic, but he was so agitated that chloroform had to be given to complete the operation. The next morning he was really hollow-eyed; he was better than for weeks, and eventually made a good recovery.

One of the essential points in operation in exophthalmic goitre is drainage. In any case of exophthalmic goitre in which any portion of it is removed it is absolutely necessary to provide largely for drainage, otherwise there will be a still further intoxication.